

**REMARKS**

Applicants appreciate the Examiner's thorough review of the present application, and respectfully request reconsideration in light of the preceding amendments and the following remarks.

Claims 1, 3-7, and 9-21 are pending in the application. Claims 2 and 8 have been cancelled without prejudice or disclaimer. Claim 1 has been amended to include claims 2 and 8 and a limitation of claim 4. Claims 1 and 3-7 have further been amended to better define the claimed invention. Claims 9-21 have been added to provide Applicants with the scope of protection to which they are believed entitled. The specification and Abstract have been placed in compliant form. No new matter has been introduced through the foregoing amendments.

The claim objection and 35 U.S.C. 112, *second paragraph* rejection are believed overcome in view of the above amendments.

The 35 U.S.C. 102(b) rejection of claims 1-8 as being anticipated by DE '422 is noted. Although DE '422 is relatively relevant, it is believed that the now claimed invention is patentable over the reference. Applicants enclose herewith, as *Exhibit A*, a computer-generated translation of DE '422 in support of the arguments advanced herein below. The Examiner is encouraged to obtain an independent, accurate translation of DE '422 to verify the following Applicants' understanding of the technology disclosed in the reference.

DE '422 teaches a retractable knob provided with pneumatic (or hydraulic) dampening means 40 for slowing down the extraction movement of the knob under the action of elastic means 5 provided between an axially slidable grip 2 of the knob and a hub 3 of the knob.

The dampening means 40, taught by DE '422 to include elements 25 and 30-34, are provided as a separate element such that it may be used also a commercial hydraulic damper. See

*Exhibit A*, page 10, the last paragraph. The two relatively movable parts of the damper, namely body 25 and sliding rod 31, can then be fixed to the hub 3 and the grip 2, respectively. *See Exhibit A*, at page 9, lines 1-11. Accordingly, the push-push device (10, 13, 16-17, 19-21) of *DE '422* for blocking the grip 2 at different axial positions relative to hub 3 must be accommodated at the rear of the knob device as best seen at element 10, 13, 16, 19-21 in Fig. 1 of therebetween. In other words, the push-push device 10, 17 of *DE '422* must be positioned axially rearwardly of the dampening means 40. This arrangement considerably increases the axial dimension of the knob and, above all, renders the assembly of the knob difficult.

On the contrary, the claimed invention calls for the arrangement of the locking mechanism at substantially the same axial position as the closed chamber, thereby reducing an overall axial dimension of the knob. This limitation finds support in Figs. 1-3 where it is disclosed that the locking mechanism 15, 27-29 are located at substantially the same axial position as the closed chamber 40. *See* also the specification at page 6, lines 1-16.

The claimed arrangement and advantage is made possible by the particular structure of the grip and hub of the knob device as now positively recited in independent claim 1. This structure allows to fully integrate the damper so as the axial dimension of the whole knob is reduced and its assembly is made considerably easier. In particular, by positioning the locking mechanism (or push-push device 15) between the sleeve of the grip (which in the disclosed embodiments also houses the spring inside its interior) and the outer wall of the hub, and at substantially the same axial position occupied by the closed chamber that provides the damping action, not only the assembly of the whole device, including the push-push element 15 is very easy but also the overall axial dimension of the device is further reduced.

The applied reference fails to teach or suggest the claimed limitation and does not appear to be capable of providing the disclosed advantage. Therefore, amended claim 1 is believed patentable over the art.

Claims 3-7 and 9-11 depend from claim 1, and are considered patentable at least for the reason advanced with respect to amended claim 1.

New independent claim 12 is similar to claim 1 and is believed patentable at least for the reason advanced with respect to amended claim 1.

Claims 13-21 depend from claim 12, and are considered patentable at least for the reason advanced with respect to claim 12.

Each of the Examiner's rejections has been overcome. Accordingly, Applicants respectfully submit that all claims are now in condition for allowance. Early and favorable indication of allowance is courteously solicited.

The Examiner is invited to telephone the undersigned, Applicant's attorney of record, to facilitate advancement of the present application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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**SPECIFICATION**

The invention refers to a turning control unit for a household appliance, in particular equipment.

From the DE 195 45 994 A1 is a concealable turning toggle unit admits for a switching or a regulating unit a control screen of exhibiting household appliance. This well-known turning toggle unit points a cap-like turningseize-hurries up, which is plug togetherable with a case-like sliding body and is adjustable together with the sliding body on a wave, which can be linked with the switching or regulating unit of the household appliance. Into turningseize-reach is arranged a compression spring, against their strength of the sliding bodies with turningseize-hurry in oh direction is press inable and due to its spring action turningseize-hurry and sliding bodies out in the reverse direction toward a release automatically by short imprinting squeezes into a control position. The wave points a dreieckfoermigen profile cross section to as well as to slot course of a Kulissensteuerung for the shifting movement of turning seizing ILS. The sliding body exhibits a corresponding kopplungselement with sliding taps, led in the slot course. The wave points, at their turningseize-hurries a cup-like beginning up, into which against turningseize-reach yourself supporting compression spring is fixed to assigned end. This cup-like beginning is separate from the remaining part of the wave by a groove, into which a flexible O-ring is inserted. This flexible O-ring causes the fact that turningseize-hurry with reaching the control position by fastening at the O-ring flexibly and thus is noiseless to the firm notice surfaces of the case-like sliding body cushioned. The flexible O-ring catches thus the kraftstoss at the end of the movement of turning seizing ILS, with which turningseize-hurry its maximum speed exhibits.

Despite this absorption at the last detent of the sinking toggle the sinking toggle can be down-pushed by the axle by repeated driving out without absorption by the hand ("snapping letting").

From the DE 198 01 300 A1 a further training from the DE 195 45 994 A1 admitted concealable turning toggle unit well-known, with that the slot course within the range of the switching points with clearance recess for the window blind tap provided is assigned and a notice at the wave the thrust ring is in such a manner that the shift of the wave is blocked, before the window blind tap reaches the slot course wall within the range of the clearance recess. The window blind can be easily wedging in the guidance pit of the sliding body led by choice of a somewhat larger thickness of the window blind than the depth of the guidance pit, so that a laminar Anreiben of the window blind takes place both against the guidance pit soil and the slot course surface. By this laminar Anreiben also a function safeguarding is reached apart from the avoidance of rattling the window blind in the guidance pit, since in unfavorable cases during the so-called 270 DEG degree turn the guidance pit is perpendicularly posed, so that during missing braking the window blind could slip simply in the guidance pit downward, if it is not prevented by the intervention of the window blind tap in the slot course from it. This would be however straight the case if in the switching point the feather/spring of turning seizing ILS with the sliding body pulls on the window blind of the switching point within the range of the clearance recess, led into it, to the center piece, so that it can slip there into the Rastkuhle, with which again turningseize-hurries in the engaging position rules. The braked guidance in consequence of the Anreibens of the window blind at the guidance pit soil a slot course surface prevents a falling out and thus a malfunctioning, with which the engaging position no more could not be achieved. The movement of the sinking position into the control position of turning seizing ILS is not affected by this friction guidance in the window blind.

The invention is the basis therefore the task, a turning control unit with a concealable turningseize-hurry to out-arrange in such a way that the danger of a replacement of the turning grasp part is decreased when driving out of the sinking position into the control position.

For the solution of this task in accordance with the invention covers the turning control unit for a household appliance, in particular equipment, beside

- a) one turningseize-hurry (turning toggle, rotary button), that
  - 1. between a sunk position (resting position, inactive position) and a control position (active position, position at hand) and
  - 2. is movable at least in the control position around an axis of rotation is swivelling,
- b) solvable retaining means (support device, locking means) to holding (lock) the turning seizing reaching into the sunk position, and
- c) at least one resetting element (drive component, resetting means) for the resetting of turning seizing ILS of the sunk position into the control position after loosening of the retaining means (waive locking), also
- d) at least one damping element (absorption member, brake element) for exercising one opposite to a resetting strength of the resetting means arranged daempfungskraft on turningseize-hurry during the movement of turning seizing ILS of the sunk position into the control position.

By the introduction of the damping element to the turning control unit into the motion equation (differential equation with the working force terms) for turningseize-hurry in its motion of the sunk position into the control position additionally for the resetting strength of the resetting element a daempfungskraft afflicted with opposite sign introduced. The daempfungskraft works against the resetting force of the resetting element and prevents that turningseize-reach without brakes into the control position fastens.

Thus the danger of an unintentional replacement of turning seizing ILS is reduced.

Favourable arrangements and training further of the turning control unit in accordance with the invention are to be taken from the dependent requirements. Generally the daempfungskraft of the damping element is one, preferably monotonous growing, function of the speed (temporal derivative of the place) of turning seizing ILS, which is preferably also independent of the place (position) of turning seizing ILS, thus with different positions equal of resting turning seizing ILS is. By the introduction of a speed-dependent, however not place-dependent absorption term in the movement motion of the turning grasp part in particular no daempfungskraft of the damping element is more effective, if turningseize-hurry in its control position rules.

Since generally the resetting element on turningseize-hurry also in its control position a resetting strength exercises to hold in order turningseize-hurry in his control position this execution form is particularly favourable, since the damping element only during the movement of turning seizing ILS, thus at a speed more largely zero, one the resetting force of the resetting element against-arranged daempfungskraft on turningseize-hurry exercises and then after reach the final position in the control position of turning seizing ILS no more daempfungskraft exercises, which would decrease the resetting force of the resetting element in unwanted way.

Preferably the damping element practices during the reverse movement of turning seizing ILS of the control position into the sunk position practically no daempfungskraft on turningseize-hurries out, so that the pressing in strength exercised by the hand no daempfungskraft works against and practically excluding the resetting force of the resetting element for sinking the turning grasp to be overcome is. The resetting strength of the resetting element depends preferably on the position of turning seizing ILS and essentially not on the speed of turning seizing ILS. Thus of the movement of the turning grasp independent and in each position a pre-defined resetting force works. Exhibit such a characteristic (characteristic) in particular flexible elements such as feathers/springs, with which within the flexible range the resetting force is



proportional to the expenditure-steered (deformed) way (Hooke law). In a special execution the resetting element is a spiral spring and the damping element is at least partly led by the interior of the spiral spring. This execution form is particularly space-saving.

That at least damping element can be in particular hydraulic or pneumatically trained.

In a particularly favourable execution form that points at least to damping element with turningsize-hurries connected and with this movable shifting element and a guide housing, in which the shifting element is resting against the inner wall of the guide housing led, up, whereby during the movement of turning seizing ILS by the sunk position into the control position a daempfungskraft is exercised by a negative pressure produced in the interior included by the guide housing and the shifting element. To the pressure balance between the interior and outside of lying range preferably a defined air passage between the shifting element and the guide housing and/or in the shifting element and/or in the guide housing formed, by air is in a quantity dependent on the difference of pressure and the passage area of the air intake into the interior to flow can.

In a constructional further training is turningsize-hurry on a carrier mechanism, e.g. a carrier axle, between the sunk position and the control position led, in sunk the position across the retaining means at the carrier mechanism fixed and in the control position relative to the carrier mechanism swivelling. The guide housing mentioned of the damping element is then preferably connected with the carrier mechanism.

The movement of turning seizing ILS between the sunk position and the control position is preferably essentially linear (axially) parallel along one essentially to the axis of rotation arranged movement axle.

The damping element can be in a space-saving arrangement at least partly within turning seizing ILS arranged.

The invention is more near described in the following on the basis remark examples. To the design is referred. Show in each case in a schematic representation:

Fig. 1 a concealable turning toggle unit in a total view, and

Fig. 2 a cut along the line II-II in Fig. 1 in the maximum pressing in position of turning seizing ILS.

In Fig. 1 and 2 represented turning control unit (turning toggle unit) 1 for serving a household appliance, for example a household appliance, in particular a cook field or a furnace, consists essentially of one turningseize-hurries 2, which with a case-like sliding body 3 connectable (plug togetherable) is, and on a wave (carrier mechanism) 4, which with a not represented switching or regulating unit of the household appliance linked and on that the sliding body 3 with its turningseize-hurry 2 against the strength of a compression spring 5 in oh direction is adjustable. The compression spring 5 is on the one hand at the cap-like turningseize-hurries 2 at a ring beginning 6 angeformten there fixed and on the other hand in a cup-like round beginning 7 at that turningseize-hurries 2 turned end of the wave 4 centerable.

The wave 4 of the turning toggle unit 1 exhibits a clutch drilling 8 for the plug-in connection at the not represented switching or regulating unit wave for the switching or controlling mean of the household appliance arranged behind a switch screen 9 in the center. The switching or placing movement takes place via rotating turning seizing ILS 2, if this itself in in Fig. 1 control position shown (disengaging or operating position) finds. With broken lines in Fig. the sinking position (engaging and/or starting position) is pointed 2, with for optical reasons and to recognizing that the appropriate does not switch is operatable, which turningseize-hurry 2 practically concisely in the switch screen 9 lies. With taken off lines is in Fig. 2 the position imprinted furthest shown, which is necessary, thus turningseize-hurry 2 over a kulissensteuerung (kulissenfuehrung) by simply

pressing between the disengaging position and the engaging position is adjustable.

The kulissenfuehrung covers a slot course ("switching heart") on the one hand 10 and one in a guidance pit 17 of the sliding body 3 sliding adjustable window blind 11 with a window blind tap (sliding pin) 12, which intervenes in the slot course 10. In the range of the switching points the slot course is provided with clearance recesses 13, which have as a consequence that when complete pressing turning seizing ILS 2 into the position after Fig. 2 the wave front surface 14 at the inner surface 15 of the cover wall of turning seizing ILS 2 knocks against, before the window blind tap 12 reaches the slot course wall 16 within the range of the clearance recess 13. This meant that with impressions of turning seizing ILS 2 very frequent in the course of the time the window blind tap 12 is not constantly stressed by the resting against the slot course wall on shearing, what with the preferential manufacturing of the window blind 11 with the window blind tap 12 from plastic to cutting it could lead. The window blind tap 12 is subjected with a spring action, which lets it rest with reaching a switching point in the sinking position of turning seizing ILS 2.

The window blind 11 can be to the reduction of schaltgeraueschen easily wedging braked in the guidance pit 17 of the sliding body 3 led. Particularly for this the thickness of the window blind is somewhat more largely selected than the depth of the guidance pit 17, so that a laminar Anreiben of the window blind takes place both against the guidance pit soil 18 and the slot course surface 19. By this laminar Anreiben also a function safeguarding is reached, there in unfavorable cases apart from the avoidance of the danger of rattling the window blind in the guidance pit, with which sucked. 270 DEG - Turn, the guidance pit 17 is perpendicular, so that during missing braking the window blind 11 could slip simply in the guidance pit downward, if it is not prevented by the intervention of the window blind tap 12 into the slot course 10 from it. This would be however straight the case if into the switching point the feather/spring 5 turningseize-reach to 2 with the sliding body and to the window blind of the switching point within the

range of the clearance recess 13 to the center piece 20, led into it, pulls, so that it can slip there into the Rastkuhle 21, in that again turningseize-hurry 2 itself in the broken engaging position in accordance with Fig. 2 finds. The braked guidance due to the Anreiben of the window blind 11 at the guidance pit soil 18 and at the slot course surface 19 prevents this falling down and thus a malfunctioning, with that the engaging position after Fig. 2 no more to be reached could not. In order to ensure a low-friction adjusting, despite the safety device over the Anreiben of the window blind, a lubricant can be intended, for example a small quantity of a special grease, which is brought into the kurvenbahn and this as well as the guidance in the guidance pit 17 lubricate. Altogether results a quietly working building group, which is beyond that surely against malfunctionings during operation of the ball-point pen-like adjustment mechanism protected.

The compression spring 5 causes it as resetting element by exercising the inherent flexible forces as resetting forces an automatic Ausfahren of turning seizing ILS 2, if the window blind tap 12 from the verrastung is loosened in the sinking position by short imprinting of turning seizing ILS 2 beyond the actual sinking position. The reverse movement of the control position back into the sinking position must be caused by exercising a manual strength with the finger on the front 22 of turning seizing ILS 2 against the resetting force of the compression spring 5.

Additionally for the resetting force of the compression spring 5 now turningseize-hurry 2 with a further strength subjected, which is exerted by a damping element 40. The daempfungskraft of the damping element 40 is opposite during the driving out movement of turning seizing ILS 22 of the sinking position into the control position of the resetting force of the compression spring 5, absorbs however, how already the name saws, only the movement and exceeds the resetting force of the compression spring 5 therefore never according to amount, so that the daempfungskraft never releases automatically a movement.

In the represented remark example the damping element 40 covers a piston-like trained shifting element 31, which is led within a cylindrical guiding device (guide housing) 25. With (outside) an end of 33 the shifting element 31 is fastened to the inside of the front part of 22 of turning seizing ILS 2. At the other (inside) end of 33 of the shifting element 31 the shifting element 31 exhibits a seal 30, with which the shifting element 31 slides along the inner wall of the guiding device 25 along.

Between the internal end of 34 of the shifting element 31 and the inner wall of the guiding device 25 an interior 32 is formed, for its expansion on the position of the shifting element 31 is dependent. The guiding device 25 is stationarily fastened to the wave 4 to this. With the movement of turning seizing ILS 2 of the sinking position into the control position and turned around thus only the shifting element 31 within the stationary guiding device 25 is along-moved. Thus the volume inside of the area 32 formed between the shifting element 31 and the guiding device 25 changes. During the driving out movement of turning seizing ILS 2 of the sinking position toward for control position develops a negative pressure in the interior 32, which one opposite for the resetting force of the compression spring 5 arranged and on turningseize-hurry 2 working daempfungskraft to the consequence has. The seal 30 is now not completely gas-tight, so that between the inner wall of the guiding device 25 and the seal 30 at the shifting element 31 a defined air passage (air gap) is formed, by air from the outside into the interior 32 to the pressure exchange to flow can. The size of the air passage, thus its passage area, determines the speed, with which air and pressure exchange takes place and is diminished thus the negative pressure in the interior 32. By attitude of the air passage between the seal 30 and the inner wall of the guiding device 25 thus the daempfungskraft of the damping element 40 can be co-ordinated exactly with the speed of turning seizing ILS 2, so that a defined dependence of the daempfungskraft on the speed of turning seizing ILS 2 is realized during the driving out movement.

With the Hereinfahrbewegung of the control position back into the sinking position within the interior 32 a positive pressure is developed, which is diminished however fast by the Lueftdurchlass between the seal 30 and the inner wall of the guiding device 25. This supported by the special organization of the seal 30 also sealing rims, by which with the Hineinfahrbewegung of turning seizing ILS 2 a larger amount of air per time unit, turned away from the sinking position, thus a larger volumetric air flow, between the interior 32 and the outside space can be exchanged than during the driving out movement.

The daempfungskraft of the damping element 40 is thus smaller with the movement from the control position to the sinking position generally than with the movement of the sinking position into the control position of turning seizing ILS 2. The damping element 40 produces thus an absorption of the Auswaertsbewegung of turning seizing ILS 2 dependent on the speed of turning seizing ILS 2 to the control position, which prevents the kraftstoss with reaching the control position clearly decreased and thus a replacement of turning seizing ILS ("out-snap").

The air passage between interior 32 can also or additionally take place by means of openings in the guiding device 25 and/or in the shifting element 31.

The shifting element 31 is led in the represented space-saving, compact execution form by the inside of the compression spring 5 designed as spiral spring.

Apart from the represented execution form of a pneumatic damping element naturally also different well-known damping elements can be used, in particular hydraulic damping elements, with which with the help of a viscous liquid like an oil or a fat a friction absorption is caused. For example coupled transmission, which stands for fat, filled box with one with a very viscous means, for example in effect connection, can be intended as damping element with turningseize-hurries. The very viscous means causes a friction absorption on the transmission and thus on turningseize-hurries 2.

**CLAIMS**

1. Turning control unit for a household appliance, in particular equipment, also
  - a) one turningseize-hurry (2), that
    1. between a sunk position and a control position and
    2. is movable at least in the control position around an axis of rotation is swivelling,
  - b) solvable retaining means (12) for holding the turning seizing reaching into the sunk position,
  - c) at least one resetting element (5) for the resetting of turning seizing ILS of the sunk position into the control position after loosening of the retaining means by exercising a resetting strength,
  - d) at least one damping element (40) to exercising opposite for the resetting strength of the resetting element arranged a daempfungskraft on turningseize-hurry during the movement of turning seizing ILS of the sunk position into the control position.
2. Turning control unit according to requirement 1, with which the daempfungskraft of the damping element a function of the speed turningseize-hurry is.
3. Turning control unit according to requirement 1 or requirement 2, with which the daempfungskraft of the damping element essentially independently of the position turningseize-hurry is.
4. Turning control unit after one of the preceding requirements, with which the damping element during the movement of turning seizing ILS of the control position into the sunk position practically no daempfungskraft on turningseize-hurry exercises.

5. Turning control unit after one of the preceding requirements, with which at least one damping element is a hydraulic damping element.
6. Turning control unit after one of the preceding requirements, with which at least one damping element is a pneumatic damping element.
7. Turning control unit according to requirement 6, with that that at least damping element with turningseize-hurry connected and with this movable shifting element (31) and a guide housing (25), in which the shifting element against the inner wall of the guide housing is resting led, enclosure, whereby during the movement of turning seizing ILS by the sunk position into the control position a daempfungskraft is exercised by one in the interior produced negative pressure umschlossenen of the guide housing and the shifting element.
8. Turning control unit according to requirement 7, with which a defined air passage between the shifting element and the guide housing and/or in the shifting element and/or in the guide housing is formed outside of lying range to the pressure balance between the interior and one.
9. Turning control unit after one of the preceding requirements, with which tumingseize-hurry on a carrier mechanism (4) between the sunk position and the control position is movable, in which sank position over the retaining means at the carrier mechanism is fixed and in the control position relative to the carrier mechanism swivelling is.
10. Turning control unit according to requirement 9 in combination with one of the requirements 7 and 8, with which the guide housing of the damping element is connected with the carrier mechanism.
11. Turning control unit after one of the preceding requirements, with which the resetting strength of the resetting element is a function of the position of turning seizing ILS and is essentially independent of the speed of turning seizing ILS.
12. Turning control unit after one of the preceding requirements, with which the



resetting element is a spiral spring and which is led at least partly damping element by the interior of the spiral spring.

13. Turning control unit after one of the preceding requirements, with which turningseize-hurry between the sunk position and the control position essentially linear along one is essentially parallel to the axis of rotation arranged movement axle movable.

14. Turning control unit after one of the preceding requirements, with which the damping element is arranged within turning seizing ILS at least partly.

15. Turning control unit after one of the preceding requirements with one with turningseize-hurry coupled control unit 11, which steers as a function of a turning position of turning seizing ILS in the control position control conditions of the household appliance.

**ABSTRACT**

The operating unit has a rotary knob (2) which can be moved between a recessed position and an operating position, the knob being rotatably at least in the operating position. A releasable pin (12) holds the knob in the recessed position. A spring (5) restores the knob to its operating position after the pin is released. A hydraulic or pneumatic damping element (40) exerts a damping force to counter the restoring force of the spring during the movement from the recessed position to the operating position.